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THE
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☞See advertisement on last page.

Poetry.

THE SAW-MILL.

BY WILLIAM C. BRYANT.

In yonder mill I rested,
And sat me down to look
Upon the wheel's quick glimmer,
And on the flowing brook.

As in a dream before me,
The saw, with restless play,
Was cleaving through a fir-tree
Its long and steady way.

The tree through all its fibres
With living motion stirred,
And in a dirge-like murmur,
These solemn words I heard :

Oh, thou who wanderest hither,
A timely guest thou art!
For thee, this cruel engine,
Is passing through my heart,

When soon, in earth's still bosom,
Thy hours of rest begin,
This wood shall form the chamber,
Whose walls shall close thee in.

Four planks—I saw and shuddered—
Dropped in that busy mill;
Then, as I tried to answer,
At once the wheel was still.

Yankee Phrases.

"As sound as a nut on the plain,"
I of late whistled "chock full" of glee,
A stranger to sorrow, and pain,
"As happy as happy could be."

"As plump as a partridge," I grew,
My heart being "lighter than cork,"
My slumbers were "calmer than dew?"
My body was "fatter than pork!"

Thus happy, I hop'd I should pass,
"Slick as grease" down the current of time;
But pleasures are "brittle as glass,"
Although "as a fiddle, they're fine."

Jemima, the pride of the vale,
"Like a top" nimbly danced o'er the plains,
With envy, the lasses were pale,
With wonder, stood gaping the swains.

She "smiled like a basket of chips"—
"As tall as a haypole," her size—
"As sweet as molasses, her lips—
"As bright as a button," her eyes.

Admiring I gazed on each charm,
My peace that would trouble so soon,
And thought not of danger or harm,
Any more than "a man in the moon."

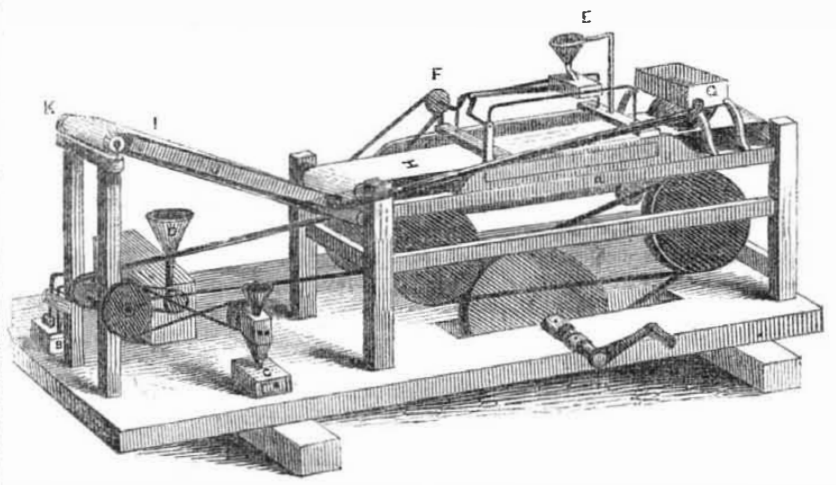
But now to my sorrow I find,
Her heart is as "hard as a brick:"
To my passion forever unkind,
Though of love I am "full as a tick."

I sought her affection to win,
In hopes of obtaining relief,
Till I, like "a hatchet grew thin,"
And she, "like a haddock grew deaf."

Unless the unpitying fates,
With passion as ardent shall warm her,
As "certain as death," or as "rates,"
I soon shall be "dead as a hammer."

MACHINE FOR MANUFACTURING SAND PAPER.

Figure 1.



This Machine is the invention of Gilbert Gorrie and William Lucas, of Troy, Rennselaer Co. N. Y., and it is a complete and very finished apparatus. Nothing appears to be overlooked. The whole machinery is combined and connected together in the most compact, simple and economical manner. Sheets of paper are placed upon an endless broad web, they are sized with glue by a brush, carried forward, sanded by a rocking sieve, and then passed over a hot steam-heated cylinder and are dried and finished in the most rapid manner.

We present two side elevation views of this machine, to exhibit it in all its parts. Fig. 1, shews the side where the power is applied, and similar letters represent the like parts on both engravings. A, is the frame. B, are beetles or pounders, to pound the glass or emery, from which it is conveyed to C, the grinder and from thence to D, the sifter or screen.—E, is the sand dusting box, operated by crank and pulley F. H, is the carrying or endless web, (the letter here is a little marred.) J, is the steam drying cylinder, heated by a pipe entering at K, and passing out at the near side goes through the glue box G, and keeps it hot. I represents the web passing over the dryer.

Figure 2.

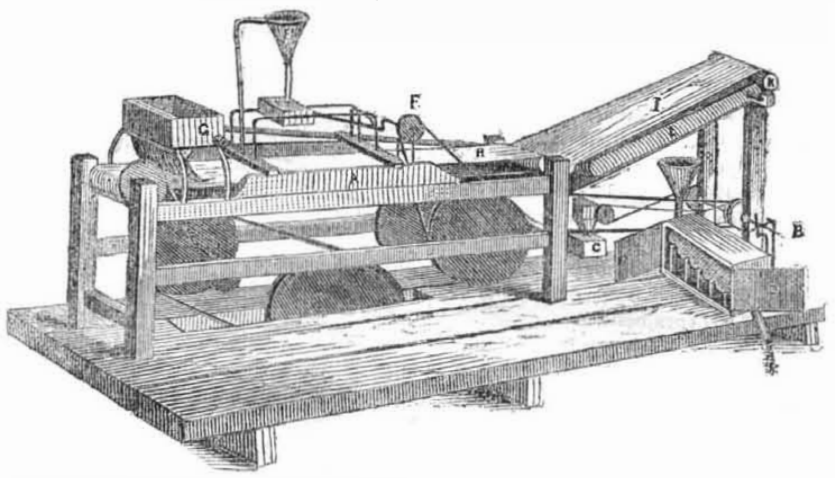


FIG. 2.—As the same letters represent like parts described in Fig. 1, we only refer to D, the screen or bolter, which sifts the sand by a rotary motion. The sand is put into the tunnel and is bolted through the wire gauze which is placed on a shaft on an incline. K, exhibits where the steam enters into the dryer, which is a flat copper cylinder. The paper is placed upon the canvas or web near to G, and it is carried on the web forward and covered with glue by a brush as broad as the web, which is connected to the size box G, and kept wet with the glue. Passing forward from the brush under E, the paper is sprinkled with sand by the rocking of the dusting box, the bottom of which is perforated with holes. The paper is carried on the canvass web to the dryer I, I, and is dried as it passes over it. This machine can be worked by hand, or by horse power. It has turned off 16 reams of finished sand paper in one hour—reams in their full size, grinding stuffs and all. It will be perceived that its motions are beautiful.

The inventors have taken measures to secure a patent and well they deserve one as it is the most perfect sand paper machine in existence, and they have judiciously arranged their machinery so that the sand and emery and glass can be ground in an open space out doors thus securing the health of the operators.

Determination.

"Resolution," says a writer, "is omnipotent." And, if we will but solemnly determine to make the best and the most of all our powers and capacities; and if to this end, with Wilberforce, we will but "seize and improve even the shortest intervals, of possibleaction and effort," we shall find that there is no limit to our advancement.

Out of 400,000 children in Kentucky 160,000 are without school advantages.

Hyalography.

The art of engraving on glass, has of late years greatly advanced in Europe, and it is asserted, that the process has now become as easy and complete as engraving on steel and copper.

Windmills.

Nine thousand windmills are constantly employed in draining the marshes of Holland.—The cost of each mill is about $14,000, and the expense yearly to keep one up, is about $300.

RAIL ROAD NEWS.

Liability of Railroads.

In the Supreme Court, this State, held two weeks ago in the case of Stoddard, & Lovering, of Boston, *vs.* the Long Island Railroad to recover damages sustained in 1846, by four cases of silk goods sent from New York by Adams and Co's Express, in the Steamboat New Haven, belonging to the defendants, and injured by the Express crate containing the goods being accidentally thrown into the dock at Allyn's Point. Judge Vanderbilt held that the defendants were not liable as common carriers, the goods being under the exclusive care of Adams & Co., but that the jury might pass on the question of neglect or carelessness on the part of the agents of the Railroad company. The jury gave a verdict for the plaintifs, of $1,436, being principal and interest.

Troy and Boston Railroad.

The bill now before the Legislature of this State, for the charter of the Boston and Troy Railroad it is supposed will be passed. It provides for building a road from Greenfield, Massachusetts, to Troy. At Greenfield the Fitchburg Road would then connect Troy with Boston, making an opposition route to the Western Railroad via Springfield. The route from Troy to Greenfield is said to be very favorable, excepting that a tunnel of four miles in length must be constructed at a cost of seven or eight hundred thousand dollars.

Tennessee Railroad.

The Bill to loan the bonds of the State of Tennessee to the amount of $500,000, to the Nashville and Chattanooga Railroad, and $320,000 to the Hiwassee Railroad, passed the House of Assembly by a vote of 37 to 35. It had already passed the Senate. Tennesse will now rank with the first States of the Union in wealth and population.

Cocheco Railroad.

The Dover Enquirer says, that the directors of the Boston and Maine Railroad have voted unanimously to recommend to their stockholders to hire the Cocheco Railroad, when the same is in readiness for use. This will insure the completion of the road at an early day. The first section from Dover to Rochester will be located and put under contract soon.

Wabash Railroad.

Books are opened at Wabash, Indiana, for additional subscriptions to the Railroad across that State from Richmond to Terre Haute.

The Directors are calling in the stock of the Chicago and Galena Railroad—$5 on the 15th day of February, and $5 on the 5th day of April.

The Hudson River Railroad has advertised for contracts for grading, masonry, piling, and bridging the 20 miles of the road between Break-Neck Hill and Pokeepsie.

Wagon Lines to Pittsburg.

To show how old things becomes new, we notice the fact of the establishment of a five day wagon line to Pittsburg, by Messrs. Oak & Cauffman, of Chambersburg, which has been for some time in operation, and the Philadelphia Ledger learns that Messrs, Leech Harris, and Co., of that city have just completed arrangements for another five-day line. The route is over the Cumberland valley road and the Chambersburg and Pittsburg turnpike.

There are thirty-two cotton factories in operation or in progress of construction, in Georgia, in which $2,000,000 are invested. From 18 to 20,000 bales of cotton were consumed last year, and the amount of manufactured goods produced was equal in value to $1,500,000

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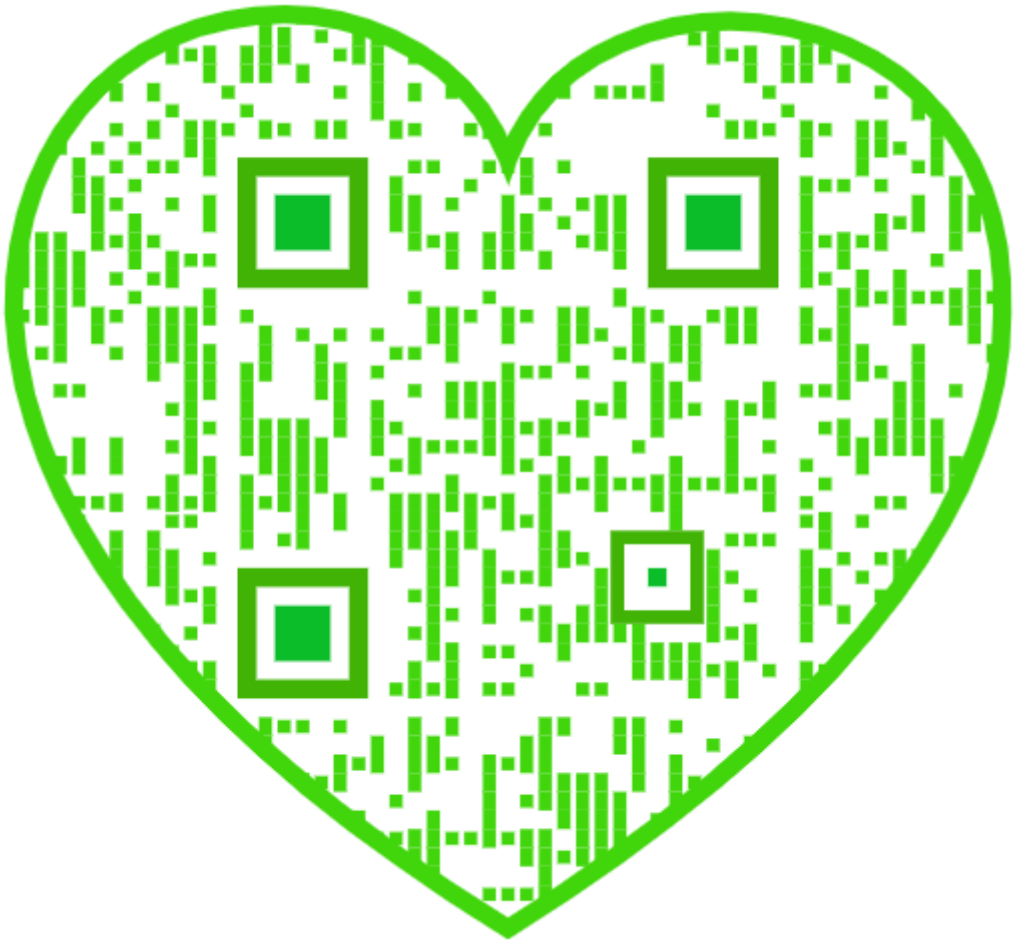

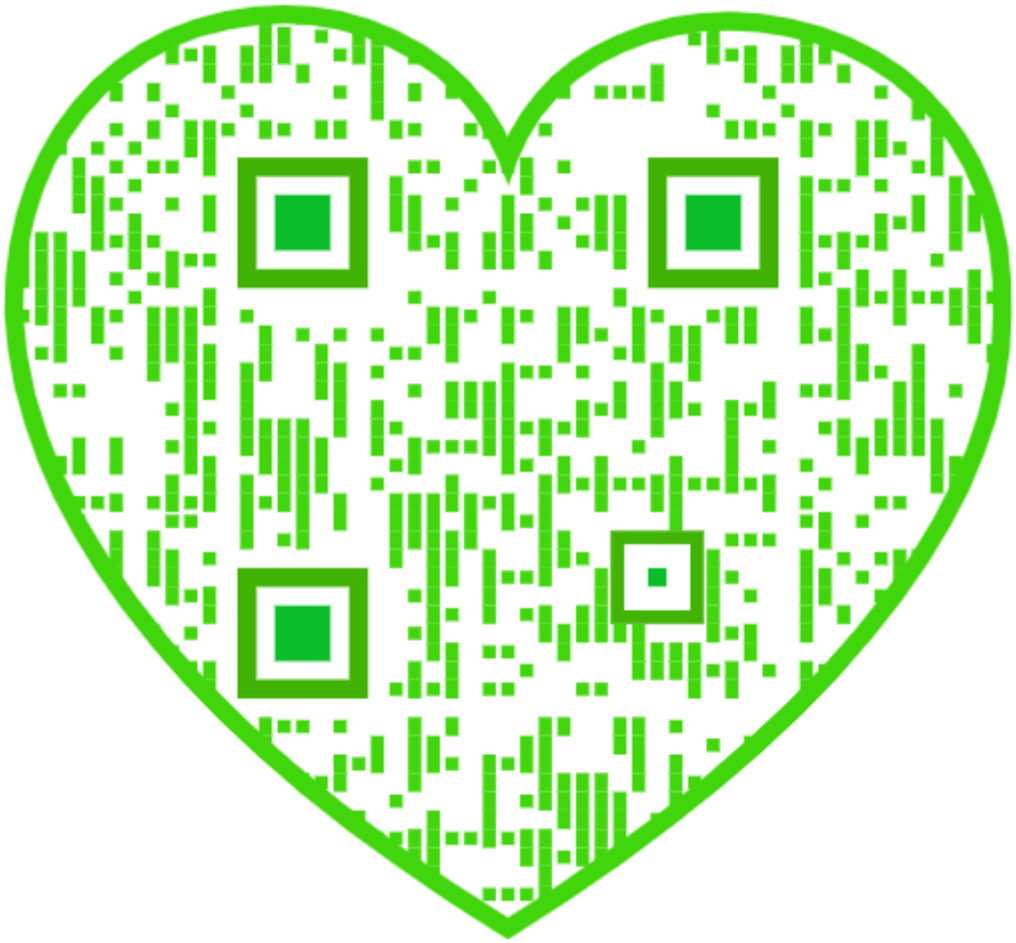

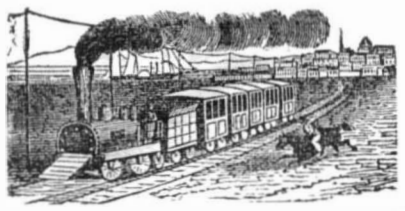

Ocean Steamer United States.

This splendid vessel, just completed by W. A. Webb, of this city, and intended to ply between New Orleans and Liverpool, made her first trial trip last Saturday morning.—Leaving Secor's wharf, foot of Ninth street at about half past 9, she reached Sandy Hook, a distance of 18 miles from Governor's Island, in 1 hour and 18 minutes, without any extraordinary exertions. In returning she met the Hibernia at Quarantine, rounded under her quarter, and running out seven miles, beat the Hibernia one mile in the distance. She had 1000 tons of coal on board, a quantity sufficient to carry her through two trial trips and a passage across the Atlantic. Her engines are from the manufactory of Messrs. Secor & Co.

Steam Boilers.

Some people think that if engines are good no matter what the boilers may be, all the requisites of power and speed are attained.—There never was a greater mistake. The boilers are the focus of power, the engines only distribute it. For this reason, all good engineers look as much to the quality of iron and the mode in which steam boilers are constructed and set up, as they do to the engines.

The Comet.

If Halley's comet appears this year, it will be seen with the naked eye as a brilliant star, but it will not be viewed with that dread which made the Emperor Charles the fifth resign his crown in 1556. Science has made us friends with the fiery hosts of heaven, and instead of dreading their appearance as our forefathers did, we look anxiously for their coming, as for that of expected long absent friends.

Surplus Money in Russia.

The Journal of St. Petersburg announces that there was again found to be a large sum in ingots and specie, to the credit of the Empire. There was taken from it on the 19th October the sum of 8,678,609 rubles, 20 kopees, which was placed with all the formalities requisite, in the presence of Prince Peter of Oldenburg, and several other high functionaries, in the vaults of the fortress of St. Peter and St. Paul. The treasure which is now laid in that fortress amounts to 114,674,-959 roubles—(a rouble equalling 75 cents.)

Extraordinary Petrifaction.

While some persons in the employ of Maj. Bates, of Guernsey, in Ohio, were engaged in quarrying stone for the repair of the National Road, on the hill west of Cambridge, they found, in a petrified state, what was supposed to have been the body of an Indian child, which perhaps centuries ago was deposited in that spot. This extraordinary specimen of ancient remains was found imbedded in a mass of solid rock, and has the appearance of a stone image, somewhat imperfect in its outer form, yet having the general outlines of the human shape. The material of which it is composed appears to be a species of limestone. In the same cavity was also found a small row of what appears to be Indian beads, matted together.

A Deacon's Invention.

A curious invention to prevent sleeping in church has been brought out. It is a long squirt fixed on the deacon's seat, under the pulpit. It turns on a pivot, and being filled with cold water it can be aimed at an individual in any part of the house. One of the audience being discovered asleep, the deacon discharges a stream of cold water in his face, which has, thus far, never failed of waking up the sleeper. Much credit is due to the gentleman who planned this ingenious device.

Sugar Crop in St. Mary.

The Franklin Planters' Banner states that the sugar crop of the parish of St. Mary for this season, (1847) amounts to 26 thousand hogsheads.

Wanted Girl Emigrants.

The poor peasant girl, the strawplatter of Buckinghamshire, the dairymaid of Devonshire, the Scotch shepherdess, and all the crowd of girls who, from time to time are compelled to resort to great cities in search of subsistence, and who, struggling amid a crowd of competitors for bread, find beauty, or even common comeliness, their bane, would, in Australia—married, full-fed, and happy—wean the rude bushmen from their barbarous ways, and bring them back to the old English style of their forefathers. The moral amendment of Australia lies in hearths and homes: and these must be founded in the wilderness —*A voice from Australia by a Bushman.*

The Oregonites and the Australians are in the same trouble about wives. We would conscientiously recommend an emigration society for the purpose of supplying the colonial young men with wives. There are hundreds of young women who would make virtuous wives who are subject daily to privations and temptations in every large city. Let them be placed in a comfortable independence and the better part of human nature will arise in ascendancy. Poverty and crime, riches, and licentiousness, are the extremes of life. Blessed is that country which is neither rich nor poor.

Prizes.

Mr. Oliver, publisher of the Organ, offers 150 dollars for the best essay, not exceedieg eight pages of the Organ, on the "Moral Religious, and Political Evils of the Liquor Traffic, and Means for its prohibition."

For the second best, the sum of fifty dollars.

The money will be paid to the successful competitors on demand, as soon as the judges announce their decision.

The following gentlemen have consented to act as judges; Rev. Stephen H Tyng, D.D. Rev. George Peck, D. D. of New York, and Rev. Henry Ward Beecher, of Brooklyn.

All papers for competition must be sent in by the 3rd of June next.

Newfoundland Fisheries.

Newfoundland, is destined. and that, before many years elapse, to fill an important space in North American history. Its capacities are immense; it possesses within and around it the elements of future power and greatness.

The French have 25,000 men engaged in the Fisheries on the banks, with 500 large vessels, and that they cure a million quintals of fish a year; the Americans 2000 schooners of 30 to 120 tons, and 37,000 men. They cure a million and a half of quintals. The British cure a million of quintals, like the French, have 25,000 fishermen and sailors employed, 520 sealing ships from 100 to 180 tons, and 10,082 open boats.

Newfoundland is also stated to be well adapted to agriculture, and is evidently one of the best nurseries for seamen in the whole world.

An Eulogy.

An editor summing up the virtues of a Soap Boiler, lately deceased, concluded his eulogy with the usual phrase of "peace to his ashes." The next day he was waited upon by a friend of the family who threatened to "pound thunder out of him" unless he made a retraction. His reference to their friend's ashes they looked upon as a personal reflection, and what is more, that they mean to treat it as such.

Sudden Growth.

A gentleman dining at a fashionable hotel, where servants were "few and far between," despatched a lad among them, for a cut of beef. After a long time the lad returned and placing it before the faint and hungry gentleman, was asked, "are you the lad who took away my plate for this beef?" "Yes, sir" "Bless me;" resumed the hungry wit, "how you have grown."

The contents of the reservoir at Massilon, Ohio, ninety feet above the town, broke out on the 23rd inst., causing a complete deluge, and tearing down several brick ware houses, a brick factory, the Trement House, the canal embankments, and almost all the storehouses.

A new plank road is projected fron Buffalo to Niagara Falls.

Hydrophobia.

The following is said to be a preventive of hydrophobia, discovered by a French physician, M. Cossar; take two table spoonsful of fresh chloride of lime, in powder—mix it with half a pint of water, and with this wash keep the wound constantly bathed, and frequently renewed. The chlorine gas possesses the power of decomposing this tremendous poison, and renders mild and harmless that venom against whose resistless attack the artillery of medical science has been so long directed in vain. It is necessary to add, that this wash should be applied as soon as possible after the infliction of the bite.

This is not a new discovery, we have known its value for a long time. Chloroform as an auxilliary would make the chloride of lime a perfect cure.

Preserving Milk.

An English paper states that Mr. Yates, an excessive corn-factor, has presented W. F. Wratislaw, of Rugby, with a can of milk capable of being kept in a good and fresh state for an indefinite length of time by means of a chemical process which it undergoes on being taken from the cow. It was manufactured at Toxall, near Stafford, on the estate of Earl Talbot. The process has been patented, and not only may a rich sweet milk be constantly had, but also a rich cream, convertible into butter, in a very short time.

New Carriage.

Mr. Maxton, the chief mechanical engineer, at Cairo, has made a design for a steam carriage, capable of conveying a whole cargo of passengers, baggage, and goods of one steamer, across the desert in a few hours, and which, with all the necessaries will cost $17,-000

A Newly Invented Rail.

The whole of the line of railway between Darlington and York in England is being relaid with new rails, chairs and sleepers. The rail is of new invention, and of a very superior make, and is considered as a great improvement upon the old description, as the surface of the rail being convex, it presents much less surface to the wheel, and thereby the friction is much reduced—a great desideratum.

New Fabric.

A new species of flaxen thread has been produced at Berlin which, the the Prussian papers say will supersede silk. We doubt it.

Gas Improvements.

Mr. Palmer an engraver of Middlesex, London has just taken out a patent for an "improved method of producing inflammable gasses of greater purity and higher illuminating power.

New Piano.

Every body has heard of the Irishman's ingenious invention intended to supersede the piano. It was composed of a horizontal board with a row of holes, through which were inserted the tails of big and little pigs, scientifically arranged according to the tones of their owner's voices. These answered in the room of keys, and the instrument was played by pinching or pulling, instead of a strike, as with the piano.

Explosion.

Lately at Charleston, S. C., a boiler at Tow's mills exploded with the most disastrous effect. The head of the boiler was blown out in an easterly direction over a street, carrying with it a portion of the roof of a stable, about 150 yards from it. The boiler itself was carried directly across Washington street, passing through a small building opposite, occupied as an office by Lewis & Rollins, colored men, and landed in their wood yard on the other side. Lewis was sitting in the office, writing at the desk, when the explosion took place. The boiler struck him in the abdomen, and literally blew to him atoms.

Since the law against dogs running at large went into operation, upwards of 500 have been slaughtered in Philadelphia, and its districts.

A whale of large size was seen off the bar at Charleston, S. C., a few days since, which is announced in the Charleston papers as a wonderful occurence.

In Russia, the pavements are almost wholly formed of wood. In New York this has been repeatedly tried, but without success.

Wood is kyanized by soaking it in a solution of corrosive sublimate, which coagulates the albumen, which is the destructible portion, and when so prepared it will not decay, or crack, by the changes of temperature.

Some of the newspapers complain of the high rate of magnetic telegraph charges in this contry. What would they say if the price of intelligence through this channel were as high as in England. The charge made by the electric telegraph between London and Liverpool for sending a dozen lines is three pounds.

A foot race lately took place in England between Jackson, the American Deer, and a man of the name of Hays. Jackson was beat two hundred yards in four miles. They run at the rate of a mile in five minutes and fifteen seconds—the swiftest running on record.

There are only two gentlemen in the Pennsylvania Legislature, all the rest of the members, 98, have to work in some shape or other for a living. So says a Pennsylvania paper, and from which we infer, that the definition of "a gentleman," in that State, is a fellow that does not work for a living, or, in other words, "a loafer."

In the New York State Lunatic Asylum, the weekly consumption of food is about 16 bbls. wheat flour—1800 lbs. of beef and mutton—280 lbs. salt fish—620 lbs, buttter, and 30 bush. potatoes, beside sundries, indian meal, tea, coffee, &c.

An act of the Ohio Legislature, of February 8, 1847, establishes the following as the weight of the bushel;—Wheat, 60 pounds; rye, flaxseed, or Indian corn, 56 pounds, barley 58 pounds. cloverseed, 64 pounds, oats 32 pounds.

Formerly when a Turkish baker was discovered to have sold bread of short weight, his ear was nailed fast to his door post, and he was then supplied with a sharp knife, to work when tired of his position his own deliverance.

The citizens of Albany, are about petitioning the Legislature to throw open the state Library on the Sabbath.

We suppose the Citizens of Albany consider that the Librarian has no right to a day of rest.

The Emperor of China is the oldest monarch in the world; Mehemet Ali, King of Egypt is next to him; Ernest Augustus, King of Hanover is the third in age; and Louis Phillipe, the fourth, and the Emperor of Austria the fifth.

Mr. Stansbury, an artist of considerable merit has made a most truthful sketch of Ex President Adams, as he laid on his couch breathing his life out, with a countenance perfectly calm and placid.

A Miller, in giving a certificate to 'the proprietor of Mr. Harrington's pills,' for destroying vermin, make the following Chinese assertion. "I was full of rats a fortnight since, and now I don't think I have one."

It is rumored that a few noblemen and gentlemen of London have formed themselves into a committee for bringing about an improvement in the dress worn by men.—*Times.*

Probably model artistry, all that they are good for, the lazy rabscallions.

A family residing in Littledale, near Lancaster, England, is said to have owned and occupied the same farm during the last 600 years; and its head is reported lately to have sold for old iron the armor in which his forefather fought at the battle of Flodden.

A plank road is to be built from the Pine Plains near Rome, Oneida Co., N. Y., to Oneida Lake. This road will open up a beautiful country.

Tenants are forming leagues against the high rents in this city.

There are seventy-three Mechanics Mutual Protections in the United States.

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For the Scientific American.

Damask Weaving.

(*Concluded from our last.*)

The Irish damask table cloth manufacturers put four threads in the mail generally, and give four threads of weft to the change of pattern, changing the pattern twice for once over the ground treadles. By this means a finer point is obtained, and, of course, a nearer approach is made to the full harness principle; for, it is evident, that if there were eight threads of weft instead of four threads given to the change of pattern, the point would be coarser in the same proportion.

In looms mounted for weaving extensive patterns, codsiderable economy is also obtained by introducing what is called single and double mounting. In the single mounting, every mail, in each part, has a cord, and needle to itself, and therefore can be raised independent of any other; the double mounting is merely certain portions of the border or body gathered. By using these a vast deal of expense is saved in drawing and designing, particularly in extensive patterns.

For example, suppose a damask table-cloth to be woven containing 63 porters of warp and 5 threads in each mail, then we have

126 porters of warp;
40 threads in one porter;

5)5040 threads;

1008 mails in the whole web.

Now, these may be divided into parts, thus:—

For one side border,	18 designs,	single	
For the body of the web,	26 do.	double;	
do. do.	12 do.	single;	
do. do.	26 do.	double;	
For the side border,	18 do.	single;	

100 designs;
10 mails in a design

1000 mails;

which deducted from the above given quantity of warp, leaves 8 mails. or 20 dents of the reed for selvages. Here the designer may draw any pattern he pleases for the borders to the extent of 18 designs, or 180 cords of the figuring machine; in the body of the table cover, he may also draw any pattern he pleases on the 12 designs in the centre, as that part is single mounting, but it must be such as will join with the 26 designs of double mounting on each side, so as to form all the patterns into one complete group. In this example the tie of the harness will be 180 cords single, of the figuring machine, of the borders: 260 cords double, and 120 single, for the body, making in the whole 560 needles for the Jacquard.

Patterns for damask table-cloths are designed on ten by ten paper, and may be woven square, by adapting the number of picks on each change of pattern to the intended thickness of the cloth. Table-cloth patterns are generally composed of coats of arms, groups of flowers, landscapes, birds, trees, &c.

Damask harnesses are sometimes mounted for the draw loom; sometimes on the Jacquard plan; and sometimes the principles of both these are combined, as, for example. when a coat of arms is to be woven in the centre of a table-cloth. In the last case, the borders and part of the body are commonly mounted for the Jacquard machine, while the part for working the armorial bearings is adapted to the draw-boy (see draw loom) In large mountings, however, there are frequently four or more simples, and sometimes four or more pulley-boxes, these boxes being placed in the most convenient position for the weaver; and when any of the simples are not employed, they are tied up and laid aside until wanted in their turn.

It may be further remarked, that, in weaving damasks, in general, when any portion of the harness cords are raised by the Jacquard to form a flowering shed, these cords must be kept raised by the machine until the proper number of picks to the card is given.

The common damask shawl has uniformly four threads in the mail; it is woven with an eight leaf setin tweel, and it may be woven with four or eight picks of weft to the change of pattern. The warp and weft of this class of goods are, for the most part, of different colors.

GILROY.

Preservation of Food.

A writer in the Westminster Review proposes to extend the principle of hermetically sealed vessels for preserving grain, to the construction of corn store houses and air tight cylinders of transport ships.

He says "in direct opposition to these principles are the granaries of Great Britain and other countries constructed. Their site is generally the bank of a river, or the sea-side. They are built of many floors, at a vast expense. They are provided with many windows, each floor being the height of a man, yet not permitting more than twelve to fifteen inches depth of grain on each floor for fear of heating, unless in the case ot very old samples. Men are continually employed to turn over the grain, to ventilate it, and clear out the vermin: and the weevil is naturalized in every crevice, as surely as bugs in neglected London beds, or cockroaches in West India sugar ships. It is the admission of air that permits this evil, that promotes germination, that permits the existence of rats and mice. In the exclusion of air is to be found the remedy.

The practicalization of this is neither difficult nor costly; on the contrary, close granaries might be constructed at far less proportional cost than the existing kind. They might be made under gronnd as well as above ground, in many cases better. They might be constructed of cast iron like gasometer tanks; or of brick and cement; or of brick and asphalte, like underground water-tanks. It is only required that they should be air-tight and consequently water-tight A single manhole at the top, similar to a steam boiler, is all the opening that is required, with an air-tight cover. The air-pump has long ceased to be a philosophic toy, and has taken its place in the arts as a manufacturers tool; and no difficulty would exist as to that portion of the mechanism. Now, if we suppose a large cast iron or brick cylinder sunk in the earth, the bottom being conical, and the top domed over; an air-pump adjusted for exhausting the air, and an Archimedean screw-pump to discharge the grain, we have the whole apparatus complete. If provide for wet grain, a water pump may be added, as to a leaky ship. Suppose now, a cargo of grain, partly germinating, and containing rats, mice, and weevils, to be shot into this reservoir, the cover put on and luted, and the air-pump at work, the germination would instantly cease, and the animal functionaries would be suspended. If it be objected that they will revive with the admission of the air, we answer, that the air need not be admitted, save to empty the reservoir. It it be contended that the reservoir may be leaky, we answer so may a ship, and if so, the air-pump must be set to work just as is the case with a water-pump in a leaky ship.

The writer further proposes to construct ships to carry corn on the same principle, viz—fill them with metal-lined air-tight compartments, like the huge tanks in a whale ship. The air could be exhausted with an air-pump, and this even new, undried grain might be carried and delivered across the sea undamaged. He says, "The corn brought down the Mississippi to New Orleans, or by canal or rail to New York, would be discharged into the airtight magazines of the vessel. On arriving at Liverpool, or Birkenhead, or Harwich, the Archimedean screw-pump would discharge the grain into close wagons on a railway, on the edge of the quay. These wagons might be rendered measures of quantity, being all made to hold a given number of quarters; and thus all labor in measuring and expense would be saved. The wagons so loaded in bulk, and without the expense of sacks, would discharge their contents into granaries, where the corn might remain secure against all detriment for any number ot years the owner might desire, with the minimum expense in transit and stowage. The wagons should be constructed with a hatch at top and a discharge pipe below."

There are thousands upon thousands of bushels of grain destroyed every year just on account of unscientifically constructed storehouses. If grain is well kiln dried and kept free from moisture it will be as good at the end of ten years as it was when first raised. This is a subject which should engage public attention as it relates to the welfare of man and the commerce and agriculture of all nations.

Rotary Pumps.

Rotary pumps have never retained a permanent place among machines for raising water: they are as yet too complex and too easily deranged to be adapted to common use.—Theoretically considered they are perfect machines, but the practical difficulties attending their construction have hitherto rendered them (like rotary steam engines) inferior to others. To make them efficient, their working parts require to be adjusted to each other with unusual accuracy and care, and even when this is accomplished, their efficiency is, by the unavoidable wear of tho esparts, speedily diminished or destroyed: their first cost is greater than that of common pumps, and the expense of keeping them in order exceeds that of others; they cannot, moreover, be repaired by ordinary workmen, since peculiar tools are required for the purpose—a farmer might almost as well attempt to repair a watch as one of these machines. Hitherto a rotary pump has been like the Psalmist's emblem of life: "Its days are as grass, as a flower of the field it flourisheth, the wind [of experience] passeth over it, and it is *gone*." Were we inclined to prophecy, we should predict that in the next century, as in the present one, the cylindrical pump will retain its pre-eminence over all others; and that makers of the ordinary ones, will then, as now, defy all attempts to supersede the object of their manufacture. —*Ewbank's Hydraulics.*

The Watch.

I have now in my hand, a gold watch which combines embellishments and utility in happy proportions, and is usually considered a very valuable appendage to the person of a gentleman. Its hands, face, and chain, and case, are the chased and burnished gold. Its gold seals sparkle with the ruby, the topaz, the sapphire, the emerald. I open it, and find that the works without which this elegantly furnished case woold be a mere shell, those motionless hands, and those figures without meaning, are made of brass. I investigate further, and ask, what is the spring, by which all these are put in motion, made of? I am told it is made of steel. I ask what is steel? The reply is, that it is iron which has undergone a certain process. So then, I find the main spring, without which the watch would be motionless, and its hands, figures, and embellishments but toys, is not of gold—that is not sufficiently good; nor of brass—that would no do—but of iron. Iron is, therefore, the only precious metal; and this watch an emblem of society. Its hands, and figures which tell the hour, resemble the master spirits of the age, to whose movements every eye is directed. Its useless but sparkling seals, sapphires, rubies, topaz, and embellishments are the aristocracy. Its works of brass are the middle class, by the increasing intelligence and power of which the master spirits of the age are moved; and its iron main spring shut up in a box, always at work, but never thought of, except when it is disordered, broke, or wants winding up, symbolically, the laboring class, which, like the main spring we wind up by the payment of wages, and, which classes are shut up in obscurity, and though constantly at work, and absolutely as necessary to the movement of society, as the iron main springs is to the gold watch, are never thought of, except when they require their wages, or are in some want or disorder of some kind or other. —*Edward Everett.*

Singular Manner of Choosing a King.

The people of Bearn, an ancient province of the Pyrenees, in the year 1183, desirous of having a sovereign of the blood of their last monarch, sent a deputation to his sister, to ask for one of her twin children. The request being granted, the deputies had their choice. The infants, at the moment, both slept. One had his hands closed, the other his open. The deputies imagined they saw, in the latter attitude, an indication of a noble and generous character. They immediately chose him: and this monarch in his after age acquired the title of Gaston, the Good.

Lightning Rods.

Instances have been known of masses of wood struck by lightning, without apparent damage externally, but which had ignited the substance inside, and burst into a flame long after the accident. This happened on board a Neapolitan line of battle ship, in the Mediterranean. The ship had returned from sea and anchored, after having been struck with lightning; all of a sudden the mast burst out into a flame. Doubtless the same is sometimes the case with the cargo. Frequently the poles of the compass have been found completely reversed.

Chain conductors of copper and iron, have been used as a preventive. They are usually set up on the approach of a thunder storm, but often too late. A better plan has been contrived. It consists of two thicknesses of short copper, laid one upon the other, in lengths of about four feet. They are riveted together at the points of junction, so as to form an elastic and continued line; this is then inlaid at the after part of the mainmast, and secured with copper nails. In the hull, the conducting line is made perfect and attached to the keelson. A square-rigged vessel afloat was fitted with this apparatus, and a powerful electric discharge was communicated to the extreme point of the main top gallant mast. It passed along the conductor, and out of the vessel, without injuring any thing, but, continuing its course several yards, it exploded some gunpowder in a boat, placed on purpose to test the actual presence and power of the electric fluid.

Pins.

A dozen years since, all the pins used in this country were imported. Now, none are imported, except a few German pins for the German population of Pennsylvania. This wonderful change has been produced by a concurrence of circumstances—the most prominent of which was the invention, by Mr. Samuel Slocum, now of Providence, of a pin-making machine far superior to any then in use in England. Of all the Pin Companies which have been established or attempted in the United States, only three are known to exist at present, viz: the American Pin Company, (which has works both at Poughkeepsie and Waterbury, Conn.,) the Howe Company at Derby, Conn., and Messrs. Pelton, Fairchild and Co. of Poughkeepsie.

A part of the pins of the American Pin Company are made of American Copper, obtained on the borders of Lake Superior.

Life's Pendulum.

At every swing of the pendulum a spirit goes into eternity. The measure of our life is a hair-breadth; it is a tale that is told; its rapidity is like the swift shuttle or the transitory rainbow, or the dazzling meteor: it is a bubble; it is a breath. At every swing of the pendulum a spirit goes into eternity. Between the rising and the setting sun 42,000 souls are summoned before their Creator. True, as well as beautiful, are those lines of Mrs. Hemans—

'Leaves have their time to fall,
And flowers to wither at the North wind's breath,
And stars to set: but all—
Thou hast all seasons for thine own, O Death.

Michael Angelo a Scholar through Life.

Michael Angelo dedicated himself, from his childhood to his death, to a toilsome observation of nature. The first anecdote recorded of him shows him to be already on the right road. Granacci, a painter's apprentice having lent him, when a boy, a print of St. Anthony beaten by devils, together with some colors and pencils, he went to the fish-market, to observe the color and form of the fins and of the eyes of fish. Cardinal Farnese one day found him when an old man, walking alone in the Coliseum, and expressed his surprise at finding him there solitary amidst the ruins: to which he replied "I go yet to school that I may continue to learn." And one of the last drawings in his portfolio is a sublime hint of his own feeling; for it is a sketch of an old man with a long beard, in a go-cart, with an hour-glass before him: and the motto, *Ancora imparo*, "I still learn."

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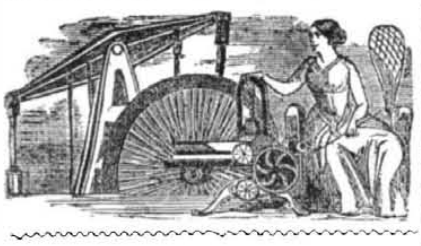


New Inventions.

New Power Loom.

Mr. P. Collins, of Cabotville, Mass., has invented an improved power loom, which a correspondent informs us, " is the most perfect and simple loom that he ever saw."—When he saw it in operation, it was weaving cloth one yard wide driven by a belt only one inch wide, and very loose. " No cams nor treadles," and makes the same quality of cloth at any degree of speed. It runs at one hundred and forty picks per minute and the cloth woven looks to be about five numbers finer than the same cloth produced by the same quality of weft in other looms. " The shuttle," our correspondent adds, " will not throw out under any circumstances, and there are no pickers to wear out." We hope to be able to present an engraving of this remarkable and valuable invention in some future number.

Improvement in Pressing Paper.

Mr. Betts, the foreman of the Pressing department of the American Bible Society in this city, has invented a machine for filling the hydraulic presses and removing the paper to and from them. Instead of removing the paper in small parcels from tables by boys at a considerable loss of time as well as great damage to the press-papers and sheets, especially where the press-papers are large and heavy. The paper to be printed is loaded on a bottom moving on rollers, and is shoved in by a boy at once without altering or disturbing the arrangement of the sheets in the least, and requiring less than half the room needed by the old plan. The process is very simple, and the inventor thinks that in our largest establishments it would save $1000 a year over the old plan.

Improvements on the Steam Engine.

We have been informed that Mr. A. D. Childs, of Lowell, Mass., has made some valuable improvements in the construction of the cylinder and the manner of operating the valves, for which he is about to take out letters patent in this country and in Europe.—From the consideration that it is about to be patented in Europe, we refrain from any further description at present.

Improved Grain Separator.

Mr. Daniel Woodbury, of Perkinsville, Vermont, has invented a new and improved Separator, for which he has taken measures to secure a patent. Mr. Woodbury is the well known inventor of an excellent Horse Power, and his Separator will be a most valuable accompaniment to it. It prevents entirely the carrying of any of the wheat over with the straw, and it will separate three times the amount of grain of other machines in one day with the same attendance as other Separators, and only two more horses. Actual experiments have already proven its value.

Artificial Arm.

Dr. Samuel H. Beam, of Philadelphia, has invented an artificial arm, which according to the accounts we have received, the French artificial arm will not hold a candle to it. It is constructed in such a manner that the motion of the elbow closes the fingers and hand into a fixed grasp, and a similar motion of the shoulder unfixes it. It is made of cork and leather, said to be superior to any thing of the kind ever before invented, as it is light and obedient to the motions of the unfortunate (and we may also say fortunate) wearer.

Stoneware for Sewers.

A patent has been taken out in England, by Messrs. Dalton & Watts, potters, Lambeth, for an improvement in material for drains, which consists in making them of stoneware, an article certainly far superior to bricks. On this side of the Atlantic this article for the same purpose is not new.

New Steam Carriage.

A correspondent writes from London, that a Mr. Adams has invented a new Steam Carriage, which will carry thirty passengers with luggage, as well as fuel and water, at the rate of 40 miles an hour on roads with very light rails, and that it is excellently adapted to new countries, and would be excellent for a railroad to the Pacific, or from the City of Mexico to Vera Cruz. It is about five tons weight, and one weighing only twenty-two hundred weight made an experimental trip on one of the English railways at the rate of forty-seven miles per hour. The carriage does not draw a train but is a carriage, engine and all complete—a steam engine travelling *caravansera*.

Important Telegraph Improvement.

To the Editor of the Sci. American.

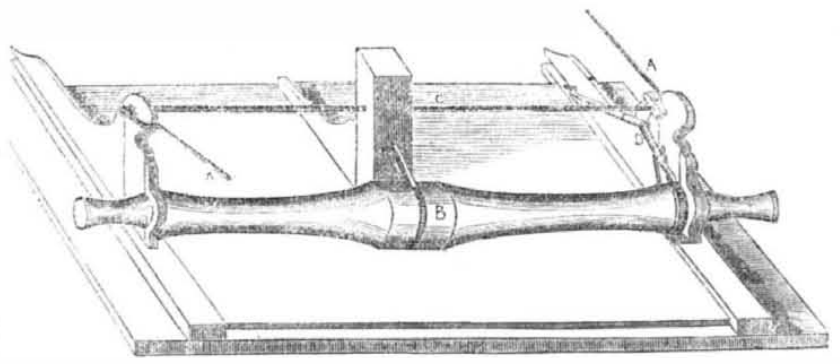
OFFICE OF THE A. & O. TELEGRAPH CO.
Philadelphia, Feb. 27, 1848.

I have succeeded in working our whole line from this place to Pittsburg, a distance of 310 miles with pure water, in place of diluted sulphuric as heretofore. Sixteen cups on the " hydropathic" system, as I call it, will work the line. I find that I do not have to amalgamate but seldom. I know not that it has ever been found successful before, in the working of a Telegraph line.

For some time past I have been using salts, but have abandoned that for water.

Yours, &c. J. MONROE LINDSEY.

IMPROVED WINDLASS.



This is an engraving of an improved windlas, invented by C. Leavitt, Esq. of Rockville, Connecticut. This view exhibits a side angle elevation so as to represent in perspective as full a display of the different parts as possible. The nature of the invention consists in applying the toggle joint in combination with the lever to work the windlass. It is well known that the toggle joint is a mechanical arrangement whereby great power is applied in a very simple manner, and Mr. Leavitt has taken advantage of this to combine it with a ship's windlass.

DESCRIPTION.—A A, are the levers connected with a metal rod C, passing horizontally through the standards on bearings. This rod is attached to the toggle joint by a reciprocating arrangement as displayed at D. On the middle of the windlass is a rack, and there is also one on the windlass in the inside of each outer standard. The catches or palls that catch and let go the windlass by working in the two outer racks, are fixed on the toggle joint. One of these is hid from view in the above engraving, but the one that is represented is guided in a groove and as the levers work the toggle joints by being placed at different angles, the windlass is operated in a most simple and effectual manner. There are palls or clamps also fixed on the middle standard E, so as to strengthen the hold back of the catches worked by the toggle joint. This is a good invention and Mr. Leavitt has taken measures to secure a patent.

It sometimes happens that two different persons, living widely apart, are engaged in studying upon the same subject and the results of their study will be nearly the same. It has occured, however, that in one instance at present, relating to the windlass, two different persons have invented valuable improvements and widely different. The other improvement will appear in the Scientific American next week. What is very singular, both models came to us a few days after one another.

Designs for Improved Blow Pipes.

The above are two very neat and beautiful designs of blow pipes, invented by Mr. H. A. Haughton, Eaton Village, Madison Co., N. Y. The cylinder of the upper one is a perfect barrel shape and the lower one is a sphere or globe shape. The ejection tube is short on the outside and extends through the inside a short distance for the purpose of throwing a stream of oxyhydrogen on any thing underneath. Its benefits are that the cylinder or globe being kept over a candle, the alcohol can be heated far more than by any other common blow pipe, and thereby a more powerful and subtle stream of heat can be applied for any of those purposes for which a blow pipe is used. The common blow pipes now in use, have their ejection tubes too long from the cylinder or gas vessel, and thus the gas is somewhat cooled or condensed before it reaches the flame, and this is the reason why some use oil, instead of alcohol, for blowing, which is very unclean to use with a brass pipe.—Three thousand of these pipes have already been ordered and thousands more will be sold. A teaspoonful of alcohol is sufficient to braze for about an hour with it. The inventor has taken measures to secure a patent. A model may be seen at this office.

Model of a Railroad Bridge.

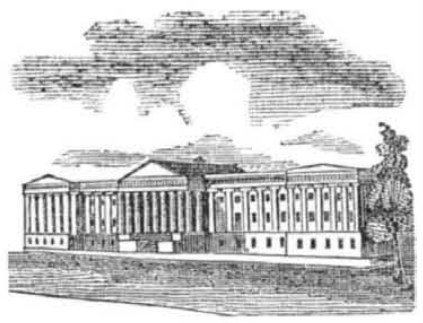
The Wilmington, (Delaware,) Republican, states that a model of a bridge has been constructed in that city intended to cross the Susquehanna River on the line of the railroad.—It has been sent to Annapolis for the inspection of the legislature. It is the work of Col. Stone, of Wilmington. The plan is entirely new. It is designed that a large pier be erected in the middle of the channel so that vessels may pass on either side; and that portion of the bridge across the channel, instead of being drawn back, is to swing round and occupy the pier, leaving a passage on either side unobstructed. One man can easily perform this duty in an almost incredible short space of time, as with three turns of a crank, if the plan of the model is carried out, the bridge may be brought round to the desired position on the pier.

[If the swinging Draw of this Bridge is all that is considered new, we must say that we have seen the same in operation ten years ago. And a few years ago one of that construction was exhibited at the Capitol of this State by Mr. William Ellis, but he did not claim to be the inventor, he only exhibited it as being the most suitable for the draw bridge proposed to be built at Albany. Probably Col. Stone's plan for swinging the draw may be new.

New Pavement.

A new pavement is being laid down in Exchange Street, Liverpool, in place of the old wood pavement. The usual stone sets are used, but they are so wrought as to be broad at the base and gradually taper at the top. The interstices are filled with small stones; and the road, when finished, will, perhaps be the best in that City, giving a firm footing to horses even in frosty weather.

The Cincinnatti (Ohio) Commercial notices a " Pedometer," a new style of watch, which besides giving the time, indicates on the dial the distance the wearer walks. It operates by an attachment to the leg.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending Feb 22, 1848.

To E. L. Norfolk and S. S. Standley, of Salem, and J. A. Marden, of Newburyport, Mass. for improvement in Looms. Patented Feb. 22, 1848.

To Robert Dillon, of New York City, for improvement in machines for Roping Bales of Goods. Patented Feb. 22, 1848.

To Joseph Harris, jr., of Boston, Mass., for improvement in anti-friction Boxes and Axles. Patented Feb. 22, 1848.

To Perry G. Gardiner, of New York City, for improvement in Presses. Patented Feb. 22, 1848.

To Charles de Manoel and E. Brafin, of St. Pierre, Martinique, for improvement in making Sugar, (the aforesaid Brafin having assigned to Charles de Manoel.) Patented Feb. 22, 1848.

To Joseph Turner, of Kensington, Pa., for for improvement in Spinning Machinery.—Patented Feb. 22, 1848.

To Jonas P. Fairlamb, of Wilmington, Del. for improvement in machinery for Splitting Leather. Patented Feb. 22, 1848.

To Horace Wood, of Troy, N. Y., for improvement in the Bench Vice. Patented Feb. 22, 1848.

To Josiah Cowles, of Belchertown, Mass., for improvement in the Bench Vice. Patented Feb. 22, 1848.

DESIGNS.

To Peter Lawson, of Lowell, Mass., for two separate Designs for Carpets. Patented Feb. 22, 1848.

RE-ISSUE.

To Thomas J. Sloan, of New York City, for improvement in Wood Screws. Patented Aug. 20, 1848. Re-issued Feb. 22, 1848.

INVENTOR'S CLAIMS.

Fire Places.

By Evans Backus, of Brooklyn, N. Y. Improvement in Parlor Fireplaces. Patented 25th September, 1847.—What I claim as my invention and desire to secure by Letters Patent is, the combination of the immediate radiators with a common open free grate, provided with doors, substantially in the manner and for the purpose set forth.

Turning Bowls.

By Parley Hutchings Jr., of Worthington, Mass.—For improvement in Machinery for Turning Bowls. Patented 25th September, 1847. Claim.—What I claim as my invention and desire to secure by Letters Patent is, the combination of the semi-circular arm with the knife frame, (holding one or more knives,) and adjustable piece, holding the gouge, for the purpose of turning wood bowls or dishes; and in combination therewith, I claim the manner of regulating the thickness and size of the bowls or dishes to be turned off, by means of the sliding or moveable bottom and the adjustable mandril and centre pin, for the purpose of turning wood bowls or dishes, in the manner as herein set forth and described.

Propelling Cars.

By Ira Avery of Tunkhannock, Pa. Improvement in propelling cars. Patented, 25th September, 1847. Claim.—What I claim as my invention and desire to secure by Letters Patent is, the application to railroads and railroad cars, &c., the air pipe, and driving wheel so adjusting them that when the air is forced into the pipe it will impart to the wheel bearing upon it a rolling motion, producing a forward movement of the body to which the driving wheel is attached.

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NEW YORK, MARCH 4, 1848.

Scientific Knowledge.

Scientific knowledge embraces the study of the whole universe. It counts the number of the rolling spheres, it measures their distances and predicts with unerring certainty the periods when those brilliant and untiring travellers will pass and repass the various celestial *milestones* which mark out the pathway in which they unceasingly journey. Lofty and sublime as is this flight of science, it is no less worthy of our admiration when it "lifts the water drop on the point of a needle" and spreads before our vision a world there too.—In the eye of God, science reveals to us, that every atom is a world, and every world an atom. Science is a correct and carefully arranged system of facts—facts relating to every operation of nature and every department of life, yea, and every condition of life too.—The workman who possesses a carefully arranged system of his own experience, is a scientific man, so far as it relates to all that he has carefully and correctly arranged, and that man is most scientific who possesses the most personal experience and accumulated information regarding the experience of others.—Science embraces every art and despises not to analyze the very dust upon which we tread and store up the results in her treasure house.

Science embraces the moral as well as the physical world, and what is of more value, she has dashed down the false philosophy, "that mind was depraved in its connexion, matter, and that happiness was to be enjoyed altogether apart and separate from the physical condition of man." This was the doctrine—the fatal doctrine for hundreds of years to the industrious classes. It was the doctrine which doomed them to find no sympathy for poverty or suffering in the bosom either of Church or State. But science now has revealed to us, that according as the many are comfortably clad, abundantly fed and the mind trained to find pleasure in true knowledge and useful information, so in proportion is virtue and happiness spread abroad among the people. Science teaches us also, that it is by industry these blessings can alone be gained and enjoyed, and in this manner she establishes the eternal truth of the mutual brotherhood of man and the relationship that exists between matter and mind, the star and the rain drop—the world and man—*the lord of creation.*

Electric Telegraphs and Patent Laws.

Professor Morse has prepared a pamphlet, which will be published in a short time, wherein will be fully set forth the injustice done him by Lord Campbell in refusing him a patent for England, by which he has been robbed of the fruits of his invention in that country. The refusal of Lord Campbell, then English Attorney General, to grant, in 1838, a patent to Professor Morse, was not because the invention was "not original," but because it had been published in England and was therefore, public property, and could not be patented. As a proof of such publication, the only evidence produced to the Attorney General, was the London Mechanics Magazine, No. 757, Feb. 10, 1838, in which was copied, without addition, the article from Silliman's Journal for January, 1838, page 185. The refusal to grant a patent because a description of the invention had been published in any periodical, is an act of legal barbarism. Such a law is against both reason and justice and can be defended upon no principle whatever but that of an absurd muddiness of intellectual regard for ancient law and nonsense Why, the very fact of a man publishing boldly his invention to the world's scan stating his exclusive right to the same, should entitle him to the more faithful protection in the property of his invention. It would be well for other nations to take an example from America in regard to the simplicity of her Patent Law Regulations.

HOUSE'S ELECTRIC TELEGRAPH.

By request we publish the following claim of R. E. House, Esq , for his Magnetic Letter Printing Telegraph :—

Claim.—"What I claim as my invention, and not previously known in the above described Magnetic Letter Telegraph, is—1. The manner in which I arrange and combine the finger keys, a key shaft, and a circuit wheel, respectively, for the purpose and substantially as herein described. 2. The combination of the escapement with the type wheel, by the means of pins in the side of said type wheel, corresponding in number with half the number of letters and other characters which the type wheel is constructed to form, and the above combination and arrangement of the escapement and type wheel in combination with magnets, as herein described, and for the purpose herein stated. 3. The combination of the type wheel with the lever, by means of pins fixed in the sides of said type wheel equal in number to the number of letters and other characters formed (and by other characters I mean as well blank spot as the letters and dot,) for the purpose of regulating the motion of the shaft, to carry the paper cylinder to and from the type wheel, all as described in said specification. 4. The manner of combining the shaft with the lever, by means of the pin, and projections on said wheel. 5. The combination of the lever with the hydraulic regulator, to produce the effect herein pointed out, and in the manner herein described. 6. The manner of producing and regulating the several motions of the paper cylinder by the combined action of the several parts respectively, as herein described, viz. the hydraulic regulator, the wheel, the lever, the type wheel the eccentric shaft, and the rods connected therewith, the ratchets or catchets, and the posts, as herein described. I also claim the manner of applying the plumbago to blacken the type, as herein described. 7 The combination of the composing apparatus with the magnet for the purposes specified."

Experiments on Iron Vessels.

One of the greatest objections to iron vessels has been the tendency of the material of which they are composed to accumulate, to an extraordinary extent, under water, a vast collection of weeds, barnacles, and all other submarine crustacea. During the last ten years various chemical preparations have been applied to obviate this well founded objection, but unfortunately, with signal failure, or such partial success that the advantages of the application of them have not been worth the trouble of the experiment, until it at length appeared to be a settled understanding that the common red lead next to the naked iron itself was the most judicious application. It could not, however, be supposed that in a country like this, so eminent for theoretical as well as practical science in chemistry, as in other arts and sciences, that all attempts to remedy the serious defects complained of, should be abandoned in blank despair; and accordingly, not a few interested in the preservation and success of iron vessels have devoted their hours of leisure to the task of discovery and experiment.

Patents innumerable have been applied for and granted in England, and compositions have been introduced under the most promising auspices but with very unsatisfactory results. The great increase of iron vessels in the British Navy has increased the necessity of some covering for the iron to prevent the evils to which they are subject, and liberal offers made by iron ship builders, and encouragement by the Admiralty and their commanders in chief, is the reason why anything approaching to a perfect chemical compound has been discovered.

In September last, 1847, metallic compositions by different chemists were applied to the Fairy steam yacht, at Portsmouth, when the success of one of them, prepared by Mr. Hay, was considered by a committee appointed to examine, to be such as to justify a more extensive and direct trial of its qualities. Accordingly, to the same vessel it was again applied, but a strong practical opinion having been expressed by many experienced men who had a great deal to do with iron boats, in favor of red lead, it was determined as a fair test of the respective merits of the two compounds, to apply to the Undine steam vessel, Mr. Hay's preparation on one side, and the common red lead on the other. Great interest was felt in the result of the experiment, than which none could be fairer, or better adapted to satisfy conflicting opinions, and to determine an important inquiry, and a period of six weeks was considered time enough to investigate the condition of the vessel. The Undine was prepared with the cempounds as above, and at the expiration of the time allotted was laid upon the graving slip in the dock yard, and, on examination by Admiral Sir Charles Ogle, the commander in chief, Mr. Fincham, the master shipwright, Mr. Owen, the supervisor of metals, and Commander Crispin, so decided a contrast was presented between one side of the vessel and the other, that no doubt of the success of the preparation of Mr. Hay over that of the common red lead remained in the minds of any of them. On the port side, covered with Mr. Hay's preparation, the bow was entirely clean, and as beautifully smooth as new copper; whilst, under the bilge, and in some places under the stern of the vessel, there were a few patches of harbor mud, and dead sea weed, which the dash of a bucket of water, or the rise of a single wave would effectually clean off.—On the red lead side, however, particularly on the bow, there was a most luxuriant crop of living green sea-weed, rendered entirely crustaceous and difficult to be removed, from the receding of the water from it; in fact, it was impossible to take off without detaching the red lead from the vessel, thereby clearly proving that the red lead was congenial to its growth, if it did not afford an actual deposit for its nature and vegetation. Nothing could be more remarkable than the regular covering of the vessel's bow with this living weed, swarming with myriads of marine insects; and nothing could be more conclusive as to the demerits of the red lead, when compared with the composition applied to the other side, than the fact, that whilst the one side was entirely smooth and clean, the other was so foul as to be green instead of red, and was more or less extended along the whole side of the vessel, and to the rudder in particular. There was no doubt at all about the matter—all present, and those who came after to inspect the vessel, expressed themselves in terms of approbation of the successful issue of the experiment. But in order to test more fully the strength of the adhesion to the red lead, and the facility with which the other side could be cleared of the trifling deposit of mud in the seams, Sir Charles Ogle ordered the Undine off the slip at high water—and as she had not been under steam for a fortnight, he directed her commander to proceed to Spithead for a short cruise, determining to have her again high and dry in the morning and then to inspect her condition. The Undine returned after 1 1-4 hour's cruise, when the port side of the vessel under water, covered with Mr. Hay's composition, was examined and found perfectly clean and smooth; and the other side was also free from the harbor mud and marine insects, which formerly adhered to the weed, but the weed itself was too strongly rooted in the red lead to be detached by the great speed of the vessel. After a minute examination the examiners confirmed the opinion they had previously expressed respecting the perfect success of Mr. Hay's invention.

Gutta Percha.

This substance, which we described in a number of articles in our last volume, is now extensively manufactured and sold in this city. It is manufactured now also very extensively by Mr. Armstrong, at his Gutta Percha Works in Brooklyn, and we believe he can scarcely supply the demand for it. It is made into all the different stuffs which we have already described in the articles alluded to, viz. soles for shoes, machine bands, waterproof cloth, covers for books, a splendid article, and into an innumerable number of other articles It may be rolled out thinner than gold beater's skin to any size. The various articles of dress, capes, leggings, umbrellas, and other defences against rain, hat cases, drinking cups, backs for hair and clothes brushes, buckets for fire engines, are a few of its various applications. In the ornamental arts, its use in book binding is becoming common. Mouldings of all possible intricacy, from ceiling mouldings down to the copy of a coin can be constructed as truthfully of the gutta percha as though the copy were made in plaster of Paris.

Iron from England.

There seems to be just ground for fears of disaster to our iron interest. The Pittsburgh Gazette, learns, on high authority, that commission-houses in Buffalo have received, via New York, iron with orders to sell at almost any price. Every ton of iron that goes to Buffalo, via New York, says the Gazette, is so much taken from the amount that Pennsylvania should sell.

The Kittaning (Pa.) Free Press, says that offers have been made by English agents to deliver in the city of Pittsburg, during the present year, not less than ten thousand tons of Scotch pigs, at less than $25. This iron is sought after in England as ballast for shipping.

Manufacturing Operations in Maine.

The Hallowell Cotton Manufacturing Company are prosecuting business to the extent of the capacity of the Mill, notwithstanding the existing depression and the suspension of Cotton Factories in other places. We are informed that the goods manufactured there, which are fine sheetings and printing cloths, are not so much depressed as the coarser fabrics.

An establishment for the manufacture of Glue has been commenced in Hallowell, and is just getting under way, preparatory to doing an extensive business the coming season, and manufacturing operations in general seem to be progressing with vigor in that place.

Patent Case.

On the 21st ult., in the U. S. Circuit Court at Philadelphia, the case of Alton vs. Ward was disposed of. The defendant had been arrested upon a charge of infringing a patent granted to plaintiff for a Coat Measure. The motion was to discharge on common bail. The court after inspecting the affidavit, dismissed the defendant, and denied the motion to order him to pay costs.

Mechanics in Kentucky.

The Kentucky Legislature has refused to admit a colored mechanic to move into that State from Virginia. The reasons assigned were various—but among them, and as chief were these, that they wanted more white mechanics, and they should never have them until labor was made reputable.

Niagara Suspension Bridge.

The process of hanging a cable across the gorge where the "international Bridge" is to be suspended, was as we learn from the Lockport Courier, accomplished in the following manner :—"A twine was first sent across the chasm attached to a kite. This done the process of drawing over cords of increased size and strength, was an easy and very simple task."

Scientific American—Bound Volumes.

The second volume of the Scientific American, bound in a superb manner, containing 416 pages choice reading matter, a list of all the patents granted at the United States Patent Office during the year, and illustrated with over 300 beautiful descriptive engravings of new and improved machines, for sale at this office—Price $2,75. The volume may also be had in sheets, in suitable form for mailing—at $2.

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For the Scientific American.

Fulminating Powder.

Mr. Editor :—In a late number of your paper you gave a process for preparing Fulminating Powder. As you are probably not aware of the extent to which this composition has been applied to practical purposes I submit the following account of its use :—

I think it was in 1816, whilst exploding some of the composition on a fire shovel, I observed that the materials melted in the first place, and remained a little time in a fluid state before exploding, showing that a little more heat was necessary to explode it than was required to melt it ; hence I thought that if I removed the composition from the fire at the instant of fusion, I should be able to save the product. This I succeeded in doing, and on examination I found I had obtained an article eight and one half times quicker than gunpowder, taking fire at a light heat. and exploding most beautifully. I made during the day sufficient for my purpose, and on the following day killed, by the aid of it a fine deer, which I drew from the woods in triumph to my quarters. To satisfy any one of its vast importance, used only as a priming, it was barely necessary to fire a small portion on paper. The excitement among our hunters was very great, and the calls on me for yellow powder, as it was called, barely as priming, at once was greater than I could supply. I continued the manufacture, greatly improving the quality of the powder, by altering the proportions of the ingredients, until some few years after, when, in filling an order for one ton my mill blew up, and myself and son barely escaped with our lives. I had in the course of my operations many dreadful explosions, and in a number of them have been severely injured. This induced me to adopt, if possible, some substitute to insure a certain and rapid discharge of fire arms. Mr. Forsyth, of Glasgow, in Scotland, had suggested a composition to be ignited by percussion. A few experiments had satisfied me of the value of the suggestion, when I abandoned yellow powder and offered Percussion Powder in lieu of it.

The greatest exploit ever made in hunting, in the State of New York, was performed, I think in 1820, with yellow powder. I engaged a small band of hunters, five in number, to hunt 5 or 6 weeks in November and December, at a camp near the " John Brown tract." In that time these hunters killed and brought in 182 deer, 1 panther, beside much other game. In precision of shooting nothing like it was ever approached by the use of gunpowder alone. Scarcely a miss-shot was made during the campaign.

A few words as to the manipulation, should it ever be called up again. Notwithstanding all my disasters, had not percussion been suggested, I should have pursued the business with redoubled energy, and at this time, had I lived, I should see yellow powder scattered over the face of the earth. To 6 lbs. of pure nitre add 3 lbs. pure carbonate of potash, and melt them in an iron vessel. Powder this mass very fine and add to 4½ parts of it one part of flowers of sulphur, mix intimately and melt over a muffled furnace on a thick iron plate. Stir and knead constantly, and as soon as the mass becomes waxy remove, and within a minute or two it will become very crumbly, when with a rolling pin, the mass may be rubbed fine enough for use. It should be immediately enclosed in air tight vessels or canisters. In the air it becomes soon damp, and our hunters renewed their priming once or twice a day, always carrying a small phial of it when on a hunt

My melter was two feet long, 6 inches wide, with sides 3 inches high on three sides, and was one inch thick, and made of wrought iron. A handle ten feet long, with a cord and pulley, enabled me to remove the pan on and off the furnace, as I needed. I usually melted 6 ounces at a time, which required some five minutes to a batch.

Allow me to describe one explosion as a sample of many similar ones which I have had. I usually stood about nine feet from the furnace and in this position 6 ounces in a melted state exploded. The first effect was to remove all the boards from the sides of the building, but a vacuum was formed so soon, that the boards all returned to their places on the timber, and remained a few seconds, when they fell upon the ground. Every thing destructible within three feet was shivered to atoms, whilst *I was unconscious of the slightest jar*, only that I was rendered deaf for a month afterwards. I have had occasion at four different times to feel astonishment, that amid such violence and destruction, I should remain without feeling the slightest agitation. S. Guthrie.

Sackett's Harbor, N. Y. Feb. 17, 1848.

For the Scientific American.

Table.

Containing the lengths of chords for divisions of a circle from 1 to 24. The diameter being 1.

Number of Divisoin.	Degrees of Division.	Length of Chord.
1		
2	180° 00'	1.000
3	120	.866
4	90	.707
5	72	.588
6	60	.500
7	51 26'	.434
8	45	.383
9	40	.342
10	36	.309
11	32 44'	.282
12	30	.259
13	27 41'	.239
14	25 43'	.222
15	24	.208
16	22 30'	.195
17	21 10'	.184
18	20	.174
19	18 57'	.165
20	18	.156
21	17 09'	.149
22	16 22'	.142
23	15 39'	.136
24	15	.130

Application.—A wheel is to be built of plank segments, 9 segments in the wheel.—What is the length of each, their diameter being 12 feet ?

Rule.—Look into the table opposite the number of segments the wheel is to be divided into, and under the heading " Length of Chord," take out the number, which multiply by the diameter of the wheel, cut off three figures from the right hand and it will be the length of the segment in parts and decimals.

Thus : Opposite 9 in table and under the heading is .342, which multiplied by 12 gives 4.104 feet, the length of segment required.

H. B. Allen.

The First American Cotton Factory.

At Pawtucket, Rhode Island, is the old mill of Samuel Slater, Esq. being the first building erected in America for the manufacture of cotton goods. It is a venerable wood built structure, two stories in height; bearing numerous evidences of its antiquity, and we believe was erected in 1793. Two spinning frames, the first in the mill, are still there, and are decided curiosities in their way. It is almost incredible to believe that this old building, time-battered and weather-browned, was the first to spread its sheltering roof over the young pupil of Arkwright, and that those dwarf frames, rusty and mildewed with inactivity, are the pioneer machines of that immense branch of our national industry—the manufacture of cotton goods. Mr. Slater, the father of American cotton manufactures, was so closely watched at the English Custom House that he could not smuggle over a drawing or pattern. He had, however, acquired a full knowledge of the Arkwright principle of spinning, and from recollection and with his own hands, made three cards and twenty-two spindles, and put them in motion in the building of a clothier, by the water wheel of an old fulling mill. Fifty-four years have since elapsed, and the business has since increased beyond all precedent in the history of manufactures. Our rivers and wild waterfalls that then flowed and bloomed in solitude, are now propelling thousands of mill wheels, and millions of shuttles and spindles. In the business, hundreds of fortunes have been made—thousands of our citizens earn a subsistence, and find constant employment, while millions are clothed in different portions of the globe. A wonderful revolution has that old mill produced on the shores of the new world.

The Growing West.

There are eight hundred and sixty-nine children attending the public schools of Milwaukie, and seventeen hundred and fifty in Chicago.

The Longitude by the Telegraph.

From the interesting Report of the Superintendant of the Coast Survey for last year, we learn that the attempts to obtain differences of longitude between Washington, Philadelphia, and Jersey City, by means of the electro-magnetic telegraph, have proved entirely successful. The Superintendant of the National Observatory, Lieut. M. F. Maury, directs the co-operation of that establishment The observations at Philadelphia were under the direction of Professor Kendall : and those at New York under the direction of Professor Loomis. The details of observation were arranged by Sears C. Walker of the Coast Survey. The principle of this method consists in transmitting signals at a determined time from one telegraph station to another, where they are noted by a time keeper, well regulated to the time of the place. The difference in the times of giving and receiving the signals, according to the local time of the station, is their difference of longitude expressed in time.

The signals are given at one of the stations by pressing a key which causes the closing of the circuit. This closing, it is intended shall be simultaneous with the ticking of a clock or chronometer, at the station. In these experiments there is liability to error. 1st. In the clock time at the different stations. These are, however, easily examined, and the most probable times assigned at each station. 2d. The time of striking the key, to close the circuit, may not coincide with the clock beat. Careful experiment failed to detect any sensible error from this source. Third. The electrical effect may take a sensible time to be transmitted, and this may be known by transmitting signals from an eastern to a western station, and vice versa. 4 From the interval between the activity of the coil, and the clock of the keeper of the magnet. 5. The error in noting the fraction of a second, as denoted by the clock. It was percived that this difference in the estimate of fractions of a second, rendered the transmission of signals by the beats of a well regulated and sideral clock, and their reception of another sideral clock, of little avail, the time falling constantly upon the same fraction of the second. The transmission of signals by beats of a mean solar chronometer, and the marking of the time of reception by a sideral clock or chronometer carries the fraction of the second over every part of the whole second, once at least, in ten minutes marks the coincidence of the beats, of the two time-keepers. By observations of the coincidences, and the marking of intervals at the same station, the law by which each observer varied in the estimate of fractions of a second became known, and of course the difference of each observer supposing them to be constant Pains were taken to compare personal equations by all the observers. It was found that when the two clocks do not coincide in their beats, the observers on the average, set down the fraction of a second too small.— Of the five errors which have been enumerated, all but the first and last turned out to be insensible ; whence it follows that the telegraphic method of comparing clocks distant two hundred miles from each other is free from error when the method of coincidence of beats is employed

How to Be Happy.

Do all the good you can Whenever you hear of a poor widow, an orphan child, or an aged man who is afflicted, pay that individual a visit. Do not hoard up all you earn ; give a certain portion to the poor. Never get angry. If you are slandered or imposed upon, better suffer a little than retaliate and use harsh words. Be not proud or selfish. Think no more highly of yourself and your talents than you do of the capacities of others. Pay all you owe. Keep out of debt. Get not entangled in the meshes of law—avoid it as the sure way to ruin. Shun vicious pursuits and unprincipled associates. Honor the Sabbath, serve God and be devoted to truth and religion Finally take a useful paper, pay for it in advance, and read it attentively : and our word for it, you will be happy. Peace and contentment will smile in your path, joy dance on your countenance, and every lane of light before you will be fraught with blessings rich and abundant.

TO CORRESPONDENTS.

" J. R. M. of N. C."—An overshot wheel is the most economical, as it regards a percentage of power, for your purpose. Below 12 feet fall, a good reaction percussion wheel would do as well, but not above that. The expense of an overshot wheel is much greater and the question with you will be—an advantage of power, or a cheap wheel. If the reaction wheel will drive your machinery with your quantity of water, and the fall that you have, get it by all means. We shall present a few articles on the making of Magnets, commencing next number.

" G. W. C. of N. Y."—The vulcanized india rubber is 55 cents per pound, of the thickness you desire. We know of no substance better than lac varnish for the sand on wood. If you would use a little ground marble, potash. and the lac varnish altogether, and dry the wood in an intensely heated oven, we think your difficulty would be surmounted and the sand would adhere even above 140.

" P. D. of Conn."—The spring in connection with a windmill would be ingenious for your purpose, and we do not believe it has ever been used in such a manner. But as it regards the economy of the invention that is a thing that experiment alone can decide. It will operate.

" A. D. C. of Mass.," and " H. G. W. of Mass." We have answered you by mail.

" L. B. of N. Y."—Your plan of supplying the boilers with water is not new. See No. 35, vol. 2, Scientific American. The alarm is new in the shape of a bell, but a whistle has been used

" J. R. of Pa."—The best Millwright's book published is " the Engineer's and Millwrights Assistant." Its cost is $22. Wiley & Putnam, or Appleton, of this city, have it. There is another, worth $3, a small work but very good, without the author's name, called the " Millwright's Guide."

" J. R N. of N. Y."—A plan upon the same principle as yours was devised and tried in England in 1844, but never was adopted practically. Your plan is more simple, as the English plan had two elevated tooth rails and wheels to bite upon them. You will perceive that objections can be raised to both plans—for instance, the strength of the notches, each must bear the enormous weight of 25 tons or more for the locomotive itself, and if one was to break, consider the consequences. We make these suggestions, as it is a very important subject and deserves much study and arrangement. What you claim as your invention, so far as we can find out, is entirely new in the arrangement for the purpose set forth.

" T. D. of N. Y."—We are not able to publish Hotchkiss's claim, as there is not a week passes but we are requested to republish five or six of them. Sometimes we do so, but not often. A patent will cover a combination although there is no change of principle, and the charge to a jury on a case of a patent infringement, is not that they shall judge whether the claim of the plaintiff is a new and useful improvement, but whether the defendant has used an invention of the plaintiff that was not publicly known or used with his consent before he got a patent for it. There are 24 or 25 patents for reaction water wheels and there would be no little clashing with the inventors if they were to go to law with each other.

" J. B. B of N. Y."—Mr. J. F. Holcomb, of Newcastle, Delaware, is the inventor of a good Hemp Brake. Mr. Anderson, of Louisville, Ky., is also the inventor of another, said to be the most improved. We believe that either knives or saws are used in them all. No machine that we are aware of, has been invented to supersede hand pulling.

" N. H. P. of Md."—The power of the Windmill does not depend exactly on the number of the arms, but the surface upon which the wind acts. The greater the surface, the greater the power, but with an increase of speed, remember that the resistance increases as 2, 4, 16, and so on. With a greater number of arms, you will have no doubt more surface, more area of vanes, but also more complexity.

" W. G. of Mass."—See your mode of propulsion described on page 411 of Robertson's London Mechanic's Magazine for 1846. The only difference in the two plans is, that you

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use cog-wheel and rack and the English plan band and pulley. Your other plan we aaw tried in 1845, by Mr. Page, of Albany.

" Bramble Brae."—We received your letter and your communication will appear next week. Are there any more of the same sort left?

" H. Z. D. of N. Y."—Next week it will appear—not possible this number.

" R. S. of Ky."—We have answered you some time since by mail.

" J. E. of Ohio."—The same plan was submitted to us last August, for an increase of strokes in the steam engine. You will perceive, however, that there is a loss of power.

" R H. of Mass."—Mr. Smith told you correctly about using an invention secretly. The prior title to the invention (if disputed) will have to be proven by witnesses to drawings, or to a model, or a description so plain that will admit of no doubt. The best thing you can do, is to make a model and apply for a patent directly. Your idea regarding the *principle*, is not correct. The manner of accomplishing the object can alone be patented—not the idea.

" R. J. P. of Va."—Get an engraving published in the Scientific American, if you want your invention to be a matter of history.

"J. R. of N. Y."—We know of no work containing the instructions you desire.

" R. McG. of Pa."—We will give your communication due attention.

" J. B. B. of Maysville, Ky."—Your volume 2 and the back numbers of the present volume were sent by Express to Buffalo, last Friday week.

" J. M. P. of Ga."—Those articles have not yet been introduced into this City, it is probable that no one but the inventor would understand adjusting them even if they had. We will inform you relative to them again.

" H. B. of Ohio."—You must not expect to receive any results but disastrous ones, if you suppose that a patent will cover all consequences.

Inducements to Inventors.

The publishers of the Scientific American purpose to issue an edition of over 20,000 copies of this paper on the 11th and 18th of March, and those persons who have new inventions they wish noticed, or engravings of such inserted, will find it to their interest to improve the above opportunity.

A Word to our Patrons.

We send with this week's paper a Prospectus of the Scientific American to a portion of our subscribers, and we hope that those who receive them will show them to their friends and acquaintances and solicit their subscriptions. See the inducement offered to Clubs.

Patent Agency.

Applications for Patents made at this office, on the most reasonable terms. Neat drawings, specifications, and engravings of the first character, and cheaper than anywhere else. Notices of new inventions, Agency for the sale of Patent Rights, and all business of that nature, promptly attended to. Those who have patent rights to dispose of will find a good opportunity and field for their sale—such as Horse Power Machines and Waterwheels of every description. The largest circulation in he world for advertisements of inventions, &c

Errata.

Figures 2 and 3 on the first page of our last number, Mr. Barnum's invention, was turned upside down by our pressman, who took out the cut to underline it for better printing.—We feel almost as much ashamed to see one of our cuts turned upside down as we would to be caught standing on our head. In future we will keep watch and ward with a sharp stick and a hook " on the end on't."

The Adventures of Capt. Huestis.

This is a thrilling narrative of the adventures of Captain D. Huestis, who enlisted in the Patriot war of Canada, was taken prisoner and sent to Van Deimans Land.

The work has reached its second edition.—It can be procured at the office of the N. Y. Pathfinder, 205 Broadway.

A beautiful model of the Sand Paper Machine which is represented on the first page of this week's paper may be seen at this office.

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☞ This paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

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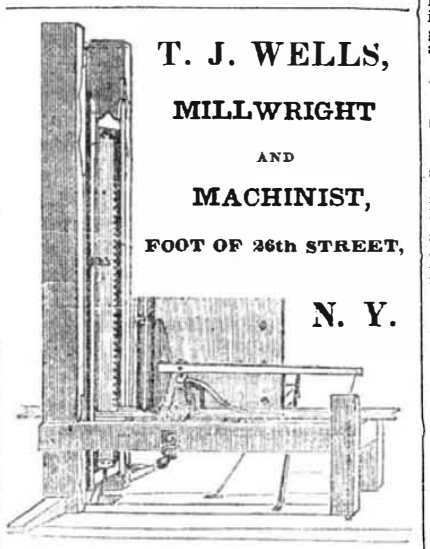

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Perkinsville, Vermont, Jan. 5, 1848. j22 6t*

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References.—Munn & Co. Scientific American, New York ; Kingsley & Pirrson, Eureka, New York; W. H. Starr, Farmer & Mechanic, New York ; S. Nichols, Editor Sunday Mercury, New York ; Williamson & Burns, Sunday Dispatch, New York ; Edmund Morris, Editor Gazette, Burlington, N. J. ; J. B. & P. Kunkle, corner of Garden and Willow sts., Philadelphia ; John Hancock, Editor Mirror of Patent Office, Washington, D. C, d25 3m*

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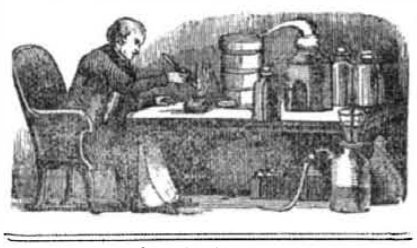


For the Scientific American.

Receipts.

PLUMBER'S CEMENT —Black rosin 1 part, brick dust 2 parts, well incorporated.

IRON RUST CEMENT.—100 parts of iron filings pounded and sifted, with 1 part of sal ammoniac. When it is applied give it a sufficiency of water to make it of a paste consistency. This cement is for filling up seams of iron.

ANOTHER OF THE SAME KIND.—Mix 4 parts of fine filings with two of potter's clay and pounded earthenware, making them into a a paste with salt and water. If this is allowed to dry slowly, it is a very good cement for iron joints, but from experience, all cements for iron joints should be allowed to dry slowly, or else it will soon become useless.

Plane Measurement.

To find the area of a circle : Multiply half the circumference by half the diameter and the product will be the area.

To find the circumference of a circle from a diameter : Multiply the diameter by 22 and divide by 7 ; or, to be more exact, multiply the diameter by 366 and divide by 133.

To find the area of a triangle : Multiply the base by the perpendicular height, and take half the product for the area.

To find the area of an oval : Multiply the longest diameter by the shortest, then multiply the product by the decimal 7.854.

NOTE.—The first problem above is found by the theorum of the triangle, for suppose the circle to be a regular polygon of an indefinite number of sides, then the sum of the sides will be the perimeter or circumference of the circle, consequently the radius or semi-diameter of the circle, will be the altitude, and the perimeter or the base of the triangle, therefore the area of the circle will be one half the circumference multiplied by one half the diameter, or one half the circumference multiplied by the radius. Euclid was the discoverer of this rule.

Mineral Analyses.

For the guidance of the blast-furnace managers, a correct analysis should, at all iron-works, be made of the coke, and its ashes, in order to show the amount, number and proportions of the earthy matter therein contained : for, unless an operative manager be made fully acquainted with the earths and oxides upon which he has to work, all his efforts will at best, be built upon conjecture, and his results entirely the effect of chance."—"The earthy matters of the ore can only be ascertained by *analysis* : repeated analysis of the iron-making materials at each separate iron work should, therefore, be made whenever the slightest alteration appears in their mality.

A furnace-manager, who is generally restricted to the use of limestone for the fusion of his materials, will have to apportion that flux in his charges, to correspond with the amount and nature of the earthy matters of his mines and fuel, and which 'amount' and 'nature' can only be known by analysis.

For finding out an inadequate flux for bringing the earthy residums of the materials used in blast-furnaces into perfect fusion without the addition of protoxide of iron—there in no other possibly safe and certain road for him to pursue than to repeatedly refer to the components of the materials upon which the furnace manager may have to operate, and that by analysis only; all other modes of proceeding would be guess-work, uncertain and unsafe.

With regard to the analysis of materials for the use of the iron-smelter the contents of his mines, limestones, charcoal, ashes, and auxilliary fluxes—all in the state in which they are put into the furnace—should be correctly ascertained and duly tabulated for ready reference to at any time.

"By the smelter obtaining a proper analysis of his materials, and by attending to assort his ores and fluxes, so that the residuary earths shall readily fuse at the usual temperature of his blast-furnace into a clear and colorless glass, or cinder, without the aid of protoxide of iron—any furnace manager may regulate his processes, so as, at all times, to obtain whatever iron result he may desire.

Curious Facts in Natural History.

About the year 1748, some laborers in working a quarry in the neighborhood of Princeton, N. J. for the stone with which the college is built, discovered a cavern which contained the entire skeletons of an immense number of the Rattlesnake (Crotalus.) The bones were in such quantities as to require two or three carts for their removal. There can be no doubt that this cavern had once a small opening, which was afterwards closed by the accidental fall of a stone or some other impediment. This had probably been the winter abode of the rattlesnake for years, where many had died through age, and others in consequence of the circumstances just mentioned. M. Humboldt, in the third volume of his Personal Narrative, hints at an occurrence somewhat similar to the above. "I had visited the caverns of the Hartz, those of Franconia, and the beautiful grotto of Treshemienshiz, in the Carpathian mountains, which are the vast cemeteries of bones of tigers, hyenas, and bears, as large as our horses." Buckland in his Geology, has an account of a hyena skeleton, discovered in Derbyshire, in a cavernous rock. He supposes the cavern to have been open, and afterwards closed by stalactites; instances of which are common in Derbyshire. "Into this cavern, I conceive," says he, "the animal had retired to die, at a period long after the existence of the marine animals which are imbedded in the surrounding rock."

The Heart.

Every time that the heart beats a contraction of the fibral fibres takes place and the blood is sent through the arteries by the force of the stroke, as water gushes through a syringe ; and exactly at the same time an equal proportion is received from the veins. Thus at every pulse, about two spoonsfull of blood are sent out from the human heart, through the arteries, and the same quantity is received from the veins. It is said that each ventricle of the heart will contain an ounce of blood. The heart contracts 4000 times an hour, from which it appears that 4000 ounces, or 250 lbs. of blood pass through the heart every hour.—The whole mass of blood in the body of a grown person is about 25 lbs., so that a quantity equal to the whole mass, passes through the heart 10 times in an hour, which is about once every six minutes. Such is the operation of the heart in the human body ; but consider what it must be in the larger animals, such as the elephant or the whale. In the latter, the tube through which the blood is forced into arteries called the *aorta*, is a foot in diameter, and ten or fifteen gallons of blood are thrown out of the heart at every stroke, and it rushes with a velocity like that of water through the sluice of a mill.

Finding the Longitude.

The following is a simple mode of finding the longitude at sea : Obtain an altitude of the sun a short time before meridian, (say 20 or 30 minutes,) note the altitude and time by chronometer. Screw the index fast and watch the sun until it falls to the same height, and note the time as before. Add the two (times) together, take the mean and apply the corrections of the chronometer. If the equation is subtractive, add it, and if additive subtract it.

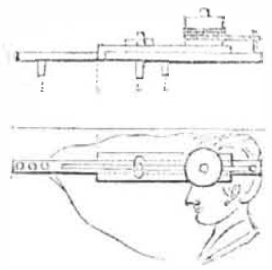
To Extract Iron Spots from Linen.

Purchase an ounce of oxalic acid at any apothecary's, put a few of the crystals on the iron spot and pour hot water on them and the iron spot will immediately disappear. Oxalic acid is a poison and looks very much like salts, therefore should be labelled and kept out of the reach of children. From experience we know that it is the best and most simple substance for extracting iron and ink spots from linen and furniture.

A wet silk handkerchief tied without folding over the face, it is said, is a good security against suffocation and smoke ; it permits free breathing, and at the same time excludes the smoke from the lungs.

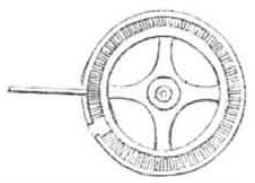
MECHANICAL MOVEMENTS.

Instrument for Drawing Curved Lines.



This engraving represents a plan and elevation of an instrument for drawing curved lines from a design. The upper figure represents an elevation of a rule having the first and third points below attached to it and held by a similar piece carrying the second point. This second point passes through a slot in the lower rule, which is allowed to slide freely in the clips, (the pieces which carry the points,) but drawn towards the right hand extremity by means of a spiral spring and band. Supposing the second point to be firmly fixed as a centre, and the third point to be passed over the outline of the face in the plan, a curved line will be produced, and if the centre be placed on the profile, a succession of similar curves may be produced by varying the position of the profile, all of which will be common to the centre.

Mangle Wheel.



This is a modification of what is generally called the Mangle Wheel, in which the uniform revolution of the pinion, which passes from one side of the large wheel to the other by means of the opening to the left, produces an alternate back and forth revolution of the larger wheel.

Scientific Memoranda.

There are many well know phenomena explicable on galvanic principles. Porter has a more lively taste from a pewter or silver cup, than from a glass one ; in the former case the moisture of the under lip, the metallic cup and the porter, form a simple galvanic circle, which gives rise to the peculiar taste.

Silver spoons are blackened in eating boiled eggs—here a galvanic circle is formed by the silver, the sulphur, the saline, or saltish matters contained in the egg ; in which case the sulphur combines with the silver, forming a blackish compound, called sulphuret of silver.

Iron railings are generally fastened into stone, by means of lead, and the iron always corrodes first, at the junction of the lead and iron with the stone ; in this case, the moisture together with the two metals, from a galvanic circle, in which the iron is the most oxidisable metal, and is the most rapidly corroded.

If a piece of gold or silver leaf be brought between the poles of a powerful galvanic battery, when in operation, they are instantly consumed ! the former giving out a splendid white light tinged with blue, and the latter a brilliant green of the emerald tint, and the light is still more intense than that from gold ; copper burns with a bluish white light, throwing off red sparks ; lead gives a vivid purple. The light given off when small pieces of charcoal are substituted for the metallic leaves, is equal in brilliancy to that of the sun, and the heat is greater, perhaps, than from any other artificial source.

If a person place his tongue between a piece of silver and a piece of zinc, and bring the outer edges of these in contact, he will perceive a peculiar taste, and in the dark will see a flash of light.

The transition of solid carbonic acid into gas deprives all around it of carbon so rapidly and to so great an extent that a degree of cold is produced immeasurably great, the greatest indeed known.

Paris Academy of Sciences.

M. Pelouse communicated a paper by M. Sobrero on which he calls mannite nitrique ; viz ; the substance called mnnnite obtained from manna, honey, &c., and treated by nitric acid. The mannite natrique or fulminating mannite, explodes under the blow of the hammer with the same violence as fulminating mercury, and produces in its decomposition sufficient heat to ignite gunpowder. M. Sobrero states that he has prepared capsules in which instead of fuminating mercury, he placed a little nitric mannite crystallized in alcohol, and discharged a fowling-piece with them several times with the same certainty as with the ordinary capsules.

A communication was received from Dr. Plouviez, of Lille, on the use of common salt as a powerful modifier of the blood.

A communication was received from M. Pallas to the effect that the greater number o nervous affections are occasioned by the exf cessive influence of atmospheric or terrestial electricity. He states, that by adapting to bedsteads glass feet, and isolating them about eighteen inches from the wall of the apartment, he has cured the patients sleeping upon them of a host of nervous affections.

Steam.

Steam heated separate from water has different properties from that heated over water. Thus, the steam in the pipe which conducts it from the boiler to the engine, may be heated till it becomes rare enough to pass through cast iron, and will readily escape at the joints and it sometimes does happen that boilers are defectively set, so as to produce a similar result.

French Royal Printing Office.

When Pope Pius the 7th visited the Royal Printing Office of Paris, he was presented with the Lord's Prayer in one hundred and fifty different languages. There are more than 150 hand presses in it and two power presses. In one room there are forty thousand forms packed away. The hands employed in it work ten hours and good compositors earn from five to six francs per day, and pressmen about the same. After thirty years service in the establishment, a workman gets a pension of four hundred francs per annum. Authors can have works of real utility printed in it free of expense.

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